ECONOMICS
& Sociology

THE INFLUENCE OF SOCIABILITY OVER NON-MORTGAGE DEBT

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ABSTRACT. In recent years, especially after the recent economic downturn, household debt has increased in importance, due to its influence on the economy in general and on households' wellbeing in particular. Therefore, the study of household debt turns out to be necessary in order to know what leads to its demand, and thus to avoid situations of over-indebtedness. In this regard, previous research has analysed debt decisions from different approaches, however, the effect of individuals' sociability has been neglected in literature.

To this end, the aim of this paper is to analyse the effect of sociability on the Europeans' decision to incur non-mortgage debt. The study sample, taken from the sixth wave (year 2015) of the Survey of Health, Ageing and Retirement in Europe, consists of 68,231 people from 18 European countries and also Israel. After applying probit binomial models, empirical evidence confirms the non-negligible effect of sociability on households' non-mortgage debts. However, this effect depends on the underlying mechanisms through which sociability operates. Thus, when the sociability variable reflects learning based on the transmission of information (or 'word of mouth'), its influence over non-mortgage debt is positive, whereas when sociability reflects learning based on observation, the effect is negative.

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Introduction

Literature on household finances has been more focused on household portfolio choices, while the emphasis on household debt is, as (Altundere, 2014) acknowledges, still novel in literature. But household debt has an outstanding importance not only for family finances, but also for the global economy. In this regard, recent literature suggests that increases in household debt are connected with lower output growth or higher unemployment (Mian et al., 2017). The aftermath of the recent economic downturn made these relationships more evident, as households' over-indebtedness led to many defaults and foreclosures.

Household debt, as a percentage of net disposable income in 2017, displays very different figures in Europe. These figures range from 57% in Slovenia to 281% in Denmark (OECD, 2019). Therefore, the study of household debt, and particularly, the study of its driving forces, turns out to be necessary. Its understanding will help with knowing what leads individuals to borrow and avoid situations of over-indebtedness. Previous research has analysed borrowing decisions from different approaches; however, the effect of individuals' sociability has been barely considered in literature. Moreover, the existence of a 'comparison effect' has hardly been analysed in the area of household debt (Georgarakos et al., 2014). To the best of our knowledge, only Georgarakos et al. (2014) addressed this issue on a sample of Dutch households. However, in their papers these authors did not analyse the role of comparison effect over informal debts.

This paper aims to fill these gaps. Thus, the aim of the paper is to analyse the influence of sociability and relative income on households' decision to incur non-mortgage debt, namely, consumer debt and informal debt. More specifically, using the sample of 68,231 individuals from 17 European countries and Israel, we explore two potential channels through which sociability may impact debt: the word-of-mouth communication and observational learning.

This paper contributes to literature in several ways. Firstly, it expands the recent literature investigating the effect of sociability and relative income on household debt, which is still rather limited (Georgarakos et al., 2014). Secondly, unlike a few empirical papers on this topic, we also analyse the effect of both aforementioned factors on informal debt. In doing so, we found that the influence of sociability and relative income depends on the nature of debt. Thirdly, we construct a richer set of key independent variables to capture sociability and relative income factors. Fourthly, we use a larger and more diverse sample of study, which not only leads to more robust results (Farrell et al., 2016), but also provides empirical evidence for a wide range of European countries. Finally, we have found empirical evidence of the effect of relative income on household debt. With these results in mind, several recommendations to improve households' indebtedness behaviour are proposed.

The remainder of the paper is structured as follows. After this introductory section, Section 2 sets the theoretical framework. Section 3 describes the methodology and the econometric approach. Section 4 summarises the empirical outcome, and finally, Section 5 presents the concluding remarks.

1. Theoretical framework

Even though the effect of social interactions on financial decisions has long been considered, especially regarding stock market participation (Brown et al., 2008; Fernández-López et al., 2018; Hong et al., 2004; Liang and Guo, 2015), the emphasis on households' borrowing behaviour is relatively recent in the literature. This research has mainly focused on studying the mechanisms related to peer effects (Altundere, 2014; Georgarakos et al., 2014),

distinguishing two fundamental channels through which social interactions may influence borrowing, namely: the word-of-mouth communication and the observational learning.

1.1. The word-of-mouth communication

Altundere (2014) points out that although people are often reluctant to reveal their debts, when faced with financial strains they are likely to seek advice from those peers better-informed about financial matters (Okten and Osili, 2004). In this regard, Okten and Osili (2004) consider that sociability can favour borrowers when they have difficulties in collecting accurate financial information, by reducing the costs of searching and accessing information, and even by avoiding financial exclusion due to the lack of credit information (Stiglitz and Weiss, 1981). Georgarakos et al. (2014) demonstrate that financial advice through individuals' social networks positively influences their level of indebtedness, supporting a word-of-mouth communication effect on debt holding.

Okten and Osili (2004) also found that community social networks, and family networks to a lesser extent, have a non-negligible impact on access to credit both on the demand and on the supply side. Besides, in difficult times, individuals might not only request information about loans, but they can also borrow from the wealthiest members of their social circles (Altundere, 2014; Brown et al., 2016). In fact, Brown et al. (2016) confirm a positive relationship between sociability and informal debts (i.e., those debts requested to family, friends, or acquaintances).

Based on the above arguments, the following hypothesis is proposed:

H1: Sociability exerts a positive influence on household indebtedness.

1.2. The observational learning

As regards indebtedness, the influence of the social group on individual behaviour is less likely to arise from information-sharing or from direct observation of peers' debts (Georgarakos et al., 2014). Debts, unlike other financial assets such as stocks, are not directly observable and people prefer not to discuss about their indebtedness nor to display debt amounts with other people because of shame or status concern (Altundere, 2014; Collins et al., 2009; Georgarakos et al., 2014). Even so, peer effects can arise through the observation of the standard of living of the social circle(s) to which the individual belongs (Altundere, 2014; Brown et al., 2016; Georgarakos et al., 2014). Specifically, through social interaction other behaviours related to income, consumption, or living standards could be observed (Altundere, 2014). In this regard, Georgarakos et al. (2014) point out that the perception of the individuals' relative standing (i.e., the socioeconomic position of the individual as regard his/her peers) can influence household debt through three potential channels:

1. By attempting to imitate the consumption level or the lifestyle of the households within the social group (Altundere, 2014), individuals can go into debt in order to position themselves in the group's social ranking (Becker et al., 2006). In this case, the effects of sociability on indebtedness come mainly from the 'comparison effect'.
2. By assuming that, in the future, being surrounded by a social group whose members display high income levels will allow the individual to borrow directly from them.
3. By assuming that individuals' future income will move into the same direction as those of their social circles ('expectation or tunnel effect').

These types of effects emanating from the perceptions of relative standing (or observational learning), and namely the comparison effect, have barely been analysed in the area of household debt, despite the fact that, as Georgarakos et al. (2014) highlight, this

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comparison effect has already been confirmed regarding other economic behaviours, such as consumption or job offer.

Under the hypothesis of relative income (Duesenberry, 1949), the first theoretical approach in formalizing the importance of peer income for consumption, those households that perceive their incomes below average within their social circle tend to spend a greater share of their income in order to keep up with their peers. To the best of our knowledge, only two papers explicitly analyse the relationship between relative standing and debt. Christen and Morgan (2005) confirm that individuals go into debt in order to maintain a certain level of visible consumption (*conspicuous consumption)* that guarantees a social position that complies with the standards set by society. Moreover, as income inequality increases, individuals -even those ones that intrinsically risk adverse- assume more debt (i.e., more risk) to keep the living standards of their social circle (Gaba and Kalra, 1999). This behaviour boost the households' financial fragility of households (Christen and Morgan, 2005), especially during the economic shocks. More recently, Georgarakos et al. (2014) find that households with perceived income below the average within their social circle tend to not only consume a greater share of their income, but even go into debt to match the standards of their peers ('the Joneses effect'). See Lance (2013) for an extended explanation.

Based on the above arguments, the following hypothesis is proposed:

H2: The relative income exerts a negative influence on household indebtedness.

2. Methodological approach

2.1. Sample and data

The data used for the analysis comes from the sixth wave of the *Survey of Health, Ageing and Retirement in Europe* (SHARE), a cross-national panel database that provides socio-demographic information on individuals aged 50 or over from various European countries as well as Israel (Börsch-Supan, 2017). The multidisciplinary nature of this survey makes possible the study of interactions between personal and social traits and financial decisions.

Data for the sixth wave, the most complete to date as regards the social network module, was conducted in 2015. Some adjustments were made to the original sample. These adjustments entail two variables -namely, financial risk preferences and income variables- due to their missing values, that might lead to significant biases and considerable losses of information (Moreno-Herrero et al., 2017). In the first case, the missing values were completed with information from the fifth wave, as the question on risk preferences is mainly posed to the refreshment sample of the sixth wave. On the second case, missing data on income was completed with the mean value over the five implicates -from the imputation module of the survey- of the household income variable. The final sample comprises 68,231 individuals living in 18 countries.

2.2. Definition and measurement of the variables

The main dependent variable for this analysis is households' consumer debt (*consumer debt*). Similarly to Altundere (2014), Georgarakos et al. (2014) and Brown et al. (2016), it is measured as a dummy variable that takes the value 1 if the household (i.e., the respondent or his/her partner) has any of the following debt: debt on cars and other vehicles; debt on credit cards/store cards; loans (from bank, building society or other financial institution); debts to

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relatives or friends; and/or student loans. The dummy dependent variable takes the value 0 in case the household does not hold any of the aforementioned debts.

Besides, as demonstrated in the following section, the empirical evidence led us to consider a second dependent variable. This variable (*informal debt*) informs about households' informal debts, given that the characteristics of this kind of debt might differ from the ones of formal debt. It is measured as a dummy variable taking value 1 if the household has any debt to relatives and friends; and value 0 otherwise.

The key independent variables for this research refer to the individuals' sociability and to households' relative income. Most of them are dummy variables that were created based on the financial literature. Thus, following Agarwal et al. (2010), Altundere (2014), Brown et al. (2016), or Okten and Osili (2004), the first variable measuring sociability (*sociability*) is a dummy variable taking value 1 if the individual participated, in the last twelve months, in any of the following activities -and value 0 if he/she did not participate in any of the activities-: done voluntary or charity work; attended an educational or training course; taken part in a political or community-related organization; or gone to a sport, social or other kind of club. According to Hong et al. (2004), the use of this kind of variables as proxies of sociability and information-sharing is supported by a vast body of literature on sociology, which emphasises the role played by informal channels (Granovetter, 1983).

Two additional variables on sociability were created, based on the previous aforementioned variable and following Altundere (2014). On the one hand, the variable on 'extensive-sociability' (*ext_sociability_#*) considers the number of activities in which the individual participates (ranging from 0 to 4). It is intended to capture the importance of participating in more than one social activity, which can lead the individual to belong to more than one social circle (i.e., sample unites, as Georgarakos et al. (2014) define them, with a common set of characteristics -e.g., age and education-). On the other hand, the variable on 'intensive-sociability' (*int_sociability*) considers the frequency of that social interaction, constituting a dummy variable taking the value 1 if the individual has done almost every day, at least one of the social activities previously listed; and the value 0 if the frequency of participation is lower.

Financial advice (*fin_advice*) is also considered in the analysis, following Georgarakos et al. (2014). A proxy variable was constructed based on the question asking for the type of help the individual received in the last twelve months. This dummy variable takes the value 1 when the individual affirms to receive help with paperwork, such as filling out forms, settling financial or legal matters; and value 0 otherwise.

The variables on relative income were also constructed in order to test the second hypothesis. Namely, a variable on relative income (*relative_inc*) comparing individual income with the median income of the country of residence was included. In this regard, values close to 1 indicate that household income is similar to the median income of the country, whereas higher (lower) values indicate that household income are above (below) the country's median income. Besides, the squared relative income variable (*relative_inc²*) was considered, in order to test potential nonlinear relationships.

In order to focus on individuals whose income falls below the country's median (Georgarakos et al., 2014), an additional variable was considered. Namely, a dummy variable (*relative_inc_d*) taking value 1 when households' relative income falls below 1; and value 0 otherwise.

Finally, other variables aimed at testing the distance to the median income of the country are included. Thus, two categorical variables were considered in the analyses: the first one denotes income quartiles (*inc_quartile_#*); and the second one (*inc_grouped_#*) stems from grouping the categories of previous variable (i.e., a variable with three categories depending if

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the household's income belongs to the first quartile -below 25%-, to the second or third quartile -between 25% and 75%-, or to the fourth quartile -upper 75%-).

Table 1 summarises the descriptions of the control variables.

Table 1. Control variables' definitions

Factor	Variable	Definition
Economic	Employment status (*employment*)	Dummy variable equal to 1 if the individual is an employee or self-employed; 0 otherwise
	Income level (*l_income*)	Natural logarithm of net annual income received by the household
Demographic	Marital status (*marital status*)	Dummy variable equal to 1 if the individual is married -living with the spouse- or in a common-law relationship; 0 otherwise
	Household size (*hhd_size*)	Number of people in the household
	Age (*age*)	Age of the individual in years
	Gender (*gender*)	Dummy variable equal to 1 if the individual is male; 0 if female
	Educational attainment (*education_#*)	Categorical variable on the highest level of education an individual has achieved according to ISCED 1997: pre-primary education (0); primary or lower secondary education (1) [reference category]; upper secondary or post-secondary non-tertiary education (2); tertiary education (3)
Behavioural	Risk preferences (*risk_aversion*)	Dummy variable equal to 1 if the individual refuses to take any financial risk; 0 if he/she is willing to take any financial risk
Countries	Country (*country_#*)	Dummy variable equal to 1 if the individual belongs to a concrete country; 0 otherwise. The countries included are Austria, Belgium, Czech Republic, Croatia, Denmark, Estonia, France, Germany, Greece, Israel, Italy, Luxembourg, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland. Austria is the reference country, so seventeen country dummy variables are included in the model.

3. Model specification

This paper is aimed at analysing the effect of sociability and relative income upon the decision to borrow. To accomplish this objective, a set of ten probit models were used to model a non-linear relationship between the dummy dependent variable and a set of independent variables.

The probit model specification was:

$$Probability\ (Y_i = 1) = \phi\ (\beta_0 + \beta_1 Sociability_i + \beta_2 Relative\ income_i + \beta_j\ Control\_variables_i)$$

The dependent variable (*Yi*) quantifies the individual's probability of holding debt, *i* is the index of the individual, and ϕ denotes the standard normal distribution function. *Sociability* includes the different measures of sociability that are consecutively included in the models. Similarly, *Relative income* includes the different measures on the households' relative income; and *Control_variables* refers to the set of control variables defined in *Table 1*.

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4. Empirical results

4.1. Univariate analysis

Summary statistics of dependent and independent variables are displayed in *Table 2*. As previously mentioned, the final sample is comprised of 68,231 individuals with an average age of 67 years old. The majority are women (56.5%) that have a formal commitment (68.3%) and are not employed (75.2%). The average number of people in the household is close to two.

Less than half of the sample (39.7%) participates in any on the social activities listed in the last twelve months. Among those who participate in social activities, 25% practise one activity, 10.3% two activities and the percentage decreases as the number of activities increase. Besides, 14.5% of the sample practise almost every day at least one social activity.

Concerning the economic situation, the household average annual income is €25,020. As regards household debt, 13.7% of respondents declare to have consumer debts, and only 1.1% admit having any informal debt (i.e., any debt to family or friends).

Almost one third of the sample (31.8%) admits receiving help with paperwork, in order to deal with issues such as financial matters. Regarding educational attainment, most of respondents indicated they have completed upper secondary or post-secondary education (37.2%), followed by those who have completed primary or lower secondary education (36%) and tertiary education (21.8%). A 74.8% of the sample refuses to take any financial risk when dealing with saving and investment decisions.

Table 2. Descriptive statistics

Variable		# Observ.	Mean	St. dev.	Min.	Max.
Consumer debt (*consumer debt*)		45,907	.137	.34	0	1
Informal debt (*informal debt*)		45,907	.011	.11	0	1
Sociability (*sociability*)		64,726	.397	.48	0	1
Intensive-sociability (*int_sociability*)		25,731	.145	.35	0	1
Extensive-sociability (*ext_sociability*)	0	64,726	.602	.48	0	1
	1		.250	.43	0	1
	2		.103	.30	0	1
	3		.035	.18	0	1
	4		.008	.09	0	1
Financial advice (*fin_advice*)		18,287	.318	.46	0	1
Relative income (*relative_inc*)		68,231	1.217	1.38	0	1.999
Household annual income (*ln_income*)*		68,231	25,020	31,35	0	27,772,8
Employment status (*employment*)		67,278	.248	.43	0	1
Age (*age*)		68,219	67.15	10.29	24	105
Gender (*gender*)		68,231	.435	.49	0	1
Marital status (*marital status*)		67,581	.683	.46	0	1
Household size (*hhd_size*)		68,231	2.17	1.02	1	15
Educational attainment	0	67,251	.047	.21	0	1
	1		.360	.48	0	1
	2		.372	.48	0	1
	3		.218	.41	0	1
Risk preferences (*risk_aversion*)		60,958	.748	.43	0	1

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Notes: *Household annual income variable is not in logs. In the case of the dichotomous variables, the value of the mean reports the percentage of people who fulfil the condition according to which the dichotomous variable takes the value equal to 1. *# Observ.* stands for Number of observations; *St. dev.* for standard deviation; *Min.* for Minimum; and *Max.* for Maximum.

Source: *own compilation from SHARE.*

Graph 1 displays the average percentage of consumer and informal debt according to the individuals' sociability and the position of household income as regard the country median income. As regards consumer debt, 'sociable' individuals display greater rates of debt (17.6% for 'sociable' individuals, and 11.9% for 'non-sociable' individuals); while those household whose income is above the country median income seems to borrow more (17.52%) than those whose income is under the country median income (10.7%). When considering informal debt, the results are slightly different. In this case, 'sociable' individuals seem to borrow less than 'non-sociable' individuals, and households with income under the country median income seem to have more debts. Even though, the differences in the case of informal debt between the indebtedness rates are not considerable.
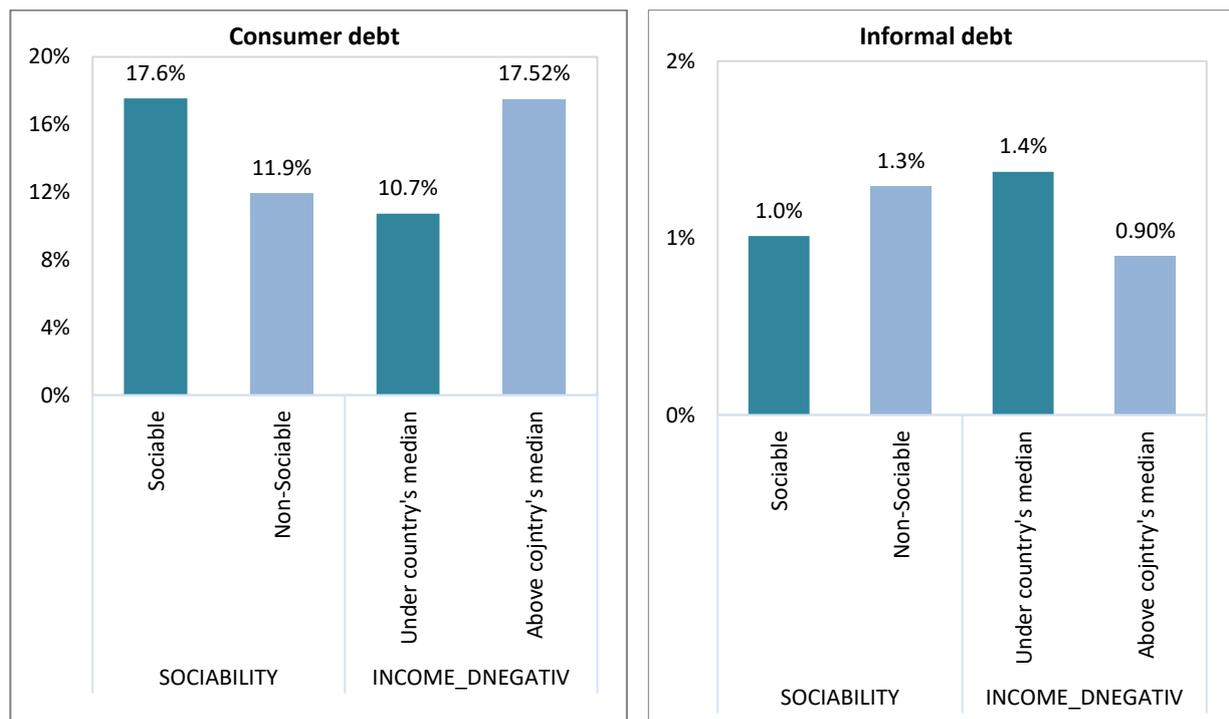
Graph 1. Debt across individuals' sociability and incomes
Source: *own compilation from SHARE.*

More differences arise when considering the debt ratio in the countries that are part of the analysis (*Graph 2*), especially as regards consumer debts. While it reaches more than 20% in countries like Denmark, Luxembourg, and Sweden, in other countries (Austria, Czech Republic, Italy, Spain, and Switzerland) less of 10% of their population has consumer debts. Regarding informal debt, most of the countries are below 1.5%, excepting Greece, where 4.41% of its population has informal debts.

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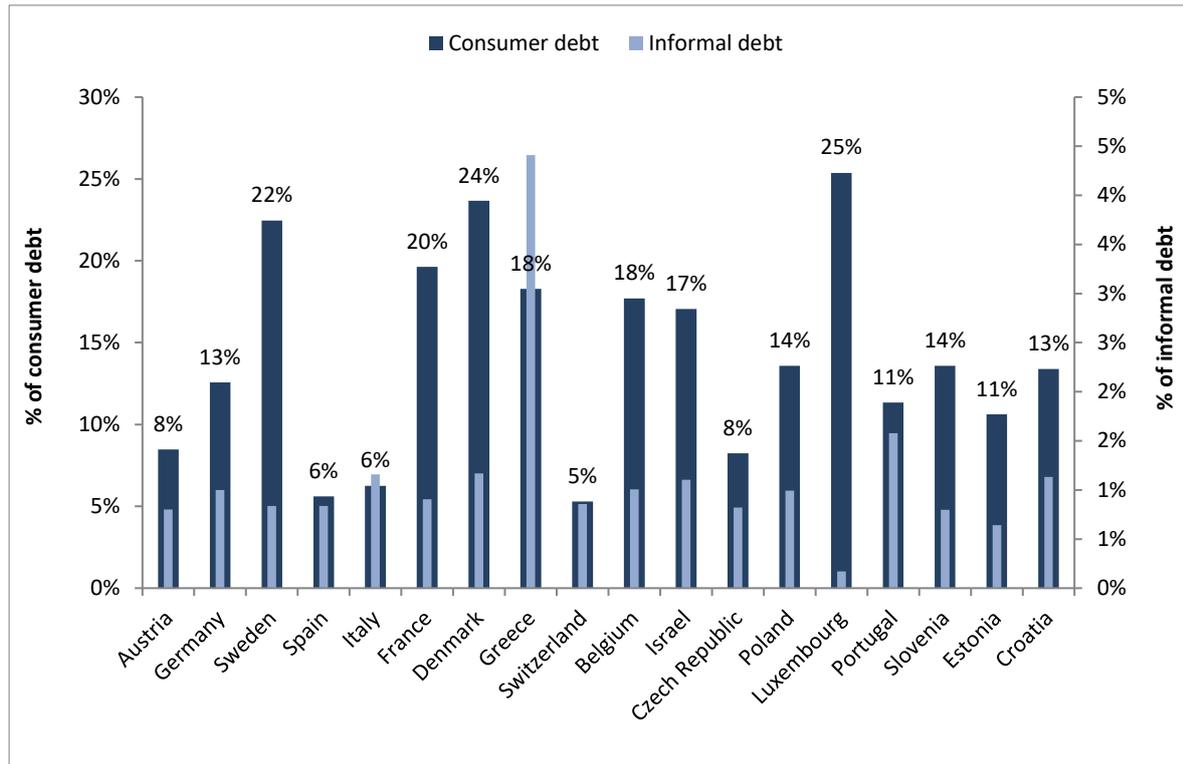
Graph 2. Type of debt by country
Source: *own compilation from SHARE.*

4.2. Multivariate analysis: consumer debt

Different empirical models were estimated in order to test the proposed hypotheses. Thus, Model 1 constitutes the base model that includes all control variables, Models 2-5 continue adding variables on sociability to test the *hypothesis 1*, and Models 6-10 add variables concerning relative income to test the *hypothesis 2*. *Table 3* presents the estimated marginal effects.

Most of the results obtained allow to confirm *hypothesis 1*; i.e., empirical evidence supports that sociability positively influences household consumer debts. Specifically, sociability (*sociability*) and extensive-sociability (*ext_sociability*) variables display statistically significant and positive results, which are in line with the findings of Altundere (2014), Brown et al. (2016), Okten and Osili (2004) and Georgarakos et al. (2014). Thus, an individual classified as 'sociable' has around 1.1% more probability of borrowing than a 'non-sociable' one. Similarly, the estimated marginal effects indicate that an individual who attends two social activities has, as compared to an individual who does not attend any social activity, 2.1% more probability of incurring consumer debts.

Likewise, 'intensive-sociability' (*int_sociability*) and financial advice (*fin_advice*) do not show any statistically significant effect, differing our results from the ones of Altundere (2014) and Georgarakos et al. (2014), who find positive outcomes for both variables. The lack of significance of these variables could be partly due to their measurement, as Altundere (2014) measures 'intensive-sociability' using a monthly frequency -instead of a daily frequency-, and Georgarakos et al. (2014) measure financial advice more directly.

In conclusion, empirical evidence reveals that the statistically significant effect of sociability resists changes in model specification (Agarwal et al., 2010). Besides, our findings suggest that sociability may increase household's consumer debt through direct information

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mechanisms (*word-of-mouth communication*). When a person interacts with others may exchange information about how to borrow, thus learning from each other in a direct and clear way (Liang & Guo, 2015; Manski, 1993, 2000), and facilitating the access to credit.

Table 3. Consumers debts: Probit estimates

		Hypothesis 1					Hypothesis 2				
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
age		-0.008***	-.009***	-.009***	-.009***	-.009***	-.008***	-.009***	-.008***	-.008***	-.008***
		(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
marital status		-.010*	-.009*	-.002	-.009*	-.018*	-.008	-.010*	-.009*	-.012**	-.011**
		(.004)	(.004)	(.008)	(.004)	(.007)	(.004)	(.004)	(.004)	(.004)	(.004)
Educational attainment [Ref. education_1]	education_0	-.013	-.013	-.018	-.013	.010	-.016	-.013	-.015	-.015	-.015
		(.010)	(.011)	(.019)	(.011)	(.029)	(.010)	(.010)	(.010)	(.010)	(.010)
	education_2	.006	.006	.004	.005	.013	.007	.006	.007	.006	.006
		(.004)	(.004)	(.008)	(.004)	(.008)	(.004)	(.004)	(.004)	(.004)	(.004)
	education_3	.003	.000	.003	-.000	.008	.001	.001	.001	-.000	.000
		(.005)	(.005)	(.009)	(.005)	(.009)	(.005)	(.005)	(.005)	(.005)	(.005)
l_income		.011***	.011***	.005	.010***	.013***		.013***			
		(.002)	(.002)	(.005)	(.002)	(.004)		(.004)			
employment		.009	.009*	.005	.009*	.009	.009*	.009*	.009*	.008	.008
		(.004)	(.005)	(.009)	(.005)	(.008)	(.005)	(.005)	(.004)	(.005)	(.005)
risk_aversion		-.003	-.002	-.004	-.002	.005	-.002	-.003	-.002	-.002	-.002
		(.004)	(.004)	(.008)	(.004)	(.006)	(.004)	(.004)	(.004)	(.004)	(.004)
gender		.018***	.018***	.021**	.018***	.027***	.017***	.018***	.017***	.017***	.017***
		(.003)	(.003)	(.007)	(.003)	(.006)	(.003)	(.003)	(.003)	(.003)	(.003)
hhd_size		.013***	.013***	.010**	.013***	.016***	.013***	.013***	.013***	.013***	.013***
		(.002)	(.002)	(.004)	(.002)	(.003)	(.002)	(.002)	(.002)	(.002)	(.002)
Countries [Ref. Austria]	Germany	.015	.016	.048*	.016	.010	.016	.016	.017	.017	.017
		(.011)	(.011)	(.021)	(.011)	(.017)	(.011)	(.011)	(.011)	(.011)	(.011)
	Sweden	.172***	.171***	.218***	.171***	.191***	.175***	.170***	.175***	.176***	.176***
		(.015)	(.015)	(.029)	(.015)	(.021)	(.015)	(.015)	(.015)	(.015)	(.015)
	Spain	-.035***	-.035***	-.017	-.035***	-.020	-.041***	-.033**	-.040***	-.040***	-.040***
		(.010)	(.010)	(.026)	(.010)	(.021)	(.010)	(.010)	(.010)	(.010)	(.010)
	Italy	-.046***	-.044***	-.002	-.044***	-.046*	-.047***	-.043***	-.046***	-.046***	-.046***
		(.009)	(.009)	(.023)	(.009)	(.018)	(.009)	(.009)	(.009)	(.009)	(.009)
	France	.109***	.111***	.125***	.110***	.141***	.113***	.111***	.113***	.113***	.113***
		(.013)	(.014)	(.027)	(.014)	(.021)	(.014)	(.014)	(.014)	(.014)	(.014)
	Denmark	.119***	.117***	.112***	.116***	.122***	.120***	.116***	.120***	.121***	.121***
		(.014)	(.014)	(.024)	(.014)	(.019)	(.014)	(.014)	(.014)	(.014)	(.014)
	Greece	.125***	.130***	.109***	.131***	.159***	.128***	.134***	.129***	.129***	.129***
		(.015)	(.016)	(.030)	(.016)	(.031)	(.015)	(.016)	(.015)	(.015)	(.015)
	Switzerland	-.062***	-.063***	-.021	-.064***	-.076***	-.058***	-.064***	-.058***	-.058***	-.058***
		(.009)	(.009)	(.022)	(.009)	(.014)	(.009)	(.009)	(.009)	(.009)	(.009)
	Belgium	.060***	.061***	.069**	.060***	.075***	.064***	.061***	.066***	.066***	.066***
		(.011)	(.011)	(.021)	(.011)	(.017)	(.012)	(.011)	(.012)	(.012)	(.012)
	Israel	.123***	.125***	.170***	.125***	.155***	.122***	.126***	.123***	.124***	.124***
		(.019)	(.020)	(.041)	(.020)	(.032)	(.019)	(.020)	(.019)	(.020)	(.020)
	Czech Republic	-.006	-.004	-.003	-.004	-.037*	-.009	-.003	-.010	-.010	-.010
		(.010)	(.011)	(.017)	(.011)	(.017)	(.010)	(.011)	(.010)	(.010)	(.010)
	Poland	.015	.019	.035	.019	.075	.008	.022	.008	.008	.008
		(.020)	(.021)	(.049)	(.021)	(.055)	(.020)	(.021)	(.020)	(.020)	(.020)
	Luxembourg	.120***	.123***	.117**	.122***	.146***	.133***	.121***	.134***	.135***	.135***
		(.016)	(.017)	(.037)	(.017)	(.025)	(.017)	(.017)	(.017)	(.017)	(.017)
	Portugal	.026	.032*	.027	.033*	.086**	.026	.036*	.026	.026	.026
		(.016)	(.016)	(.037)	(.016)	(.033)	(.016)	(.017)	(.016)	(.016)	(.016)
	Slovenia	.047***	.049***	.074**	.049***	.065**	.042***	.050***	.042***	.042***	.042***
		(.012)	(.012)	(.025)	(.012)	(.020)	(.012)	(.012)	(.012)	(.012)	(.012)
	Estonia	.018	.020	.032	.020	.060**	.010	.022	.010	.010	.010
		(.010)	(.011)	(.019)	(.011)	(.020)	(.010)	(.011)	(.010)	(.010)	(.010)
	Croatia	.093***	.097***	.051*	.097***	.138***	.077***	.102***	.078***	.078***	.078***
		(.015)	(.016)	(.024)	(.016)	(.034)	(.014)	(.017)	(.014)	(.014)	(.014)
sociability			.011**				.012**	.011**	.012**	.011**	.011**
			(.004)				(.004)	(.004)	(.004)	(.004)	(.004)
fin_advice				-.010							
				(.007)							
Extensive-sociability	ext_sociability_1				.008						
					(.004)						
					.021***						

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		Hypothesis 1					Hypothesis 2			
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
[Ref. ext_sociability_0]	ext_sociability_2				(.006)						
	ext_sociability_3				.015 (.009)						
	ext_sociability_4				.002 (.016)						
int_sociability						-.005 (.008)					
relative_inc							.011*** (.003)	-.001 (.005)			
relative_inc²							-.001* (.000)	-.000 (.000)			
relative_inc_d									-.016*** (.004)		
Income quartiles [Ref. inc_quartile_1]	inc_quartile_2									.015** (.005)	
	inc_quartile_3									.022*** (.005)	
	inc_quartile_4									.029*** (.006)	
Income quartiles grouped [Ref. inc_grouped_2]	inc_grouped_1										-.018*** (.004)
	inc_grouped_3										.009* (.004)
N		39,649	38,769	9,755	38,769	16,181	39,359	38,769	39,359	39,359	39,359
Wald X² (d.f.)		3802.3*** (27)	3731.5*** (28)	1159.1** (28)	3737.8*** (31)	1425.3*** (28)	3781.8*** (29)	4335.6** (30)	3778*** (28)	3783*** (30)	3782.7*** (29)
Pseudolikelihood		-14041.46	-13,887,952	-30,596,862	-13,885,245	-67,411,818	-14130.81	-13886333	-14129944	-14124493	-14125279
Hosmer-Lemeshow X² (8 d.f.)		13.54*	18.59**	5.68	18.43**	9.27	18.25**	19.61**	16.72**	20.57**	20.17***
R² McFadden		.137	.135	.190	.136	.110	.134	.135	.134	.134	.135

NOTES: the table shows the estimates on the probit models that estimate the effect of sociability and relative income on household indebtedness. In particular, the marginal effects of each estimate are identified. The levels of significance are given by * for 10%, ** for 5%, and *** for 1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

Empirical evidence does not allow to confirm *hypothesis 2*. Contrary to expected, relative incomes seem to positively influence debt behaviour; i.e., the higher the household relative income, the greater the probability of borrowing. This probability increases at a decreasing rate, as it is shown by the negative sign of the square of relative income (Model 6). However, these statistically significant effects disappear when the model controls by households' income (Model 7).

The variables on income quartiles (*inc_quartile_#* and *inc_grouped_#*) reinforce the positive relationship between relative income and consumer debt. Moreover, the dummy variable on relative income (*relative_inc_d*) indicates that those individuals whose income is lower than the country median income are less likely to borrow.

These results differ from the findings of Christen and Morgan (2005) and Georgarakos et al. (2014). The difference may be motivated by the use of different databases and by the difference in the measurement of variables; namely, the measurement of relative income. In this regard, Georgarakos et al. (2014) use a question that explicitly measures the perception of relative income, as these authors ask directly about individuals' perception of the income of their peers in their social circle; while Christen and Morgan (2005) use the GINI index to measure differences in income.

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However, the data obtained could be hiding another issue related to the offer on the credit market. Given that the estimates show that those individuals whose income is above the median income of their country are more likely to hold consumer debts, it could occur that higher incomes give individuals more power and easier access to the credit market.

To test this possible explanation, *hypothesis 2* is re-estimated in the next section using informal loans as independent variable.

4.3. Multivariate analysis: informal debt

Our results (see *Table 4*) confirm the hypothesis 2 in the field of informal debt; i.e., the poorer the individuals perceive themselves in relation to others; the more likely they are to borrow from their family or friends. Besides, the marginal effect of the dummy variable on relative income and the categorical variables on income quartiles reinforce this relationship.

These results are in line with the findings of Christen and Morgan (2005) and Georgarakos et al. (2014). In this regard, Brown et al. (2016) and Putnam (2000) underline the important role that informal credit channels play in reducing financial problems and, particularly, these authors highlight that social networks can provide emotional and financial support for individuals.

It is noteworthy that sociability variable fails to be statistically significant in any of the estimated models. Therefore, empirical evidence does not allow to confirm the influence of sociability on informal debt.

Table 4. Informal debt: Probit estimates

		M6	M7	M8	M9	M10
age		-.001***	-.001***	-.001***	-.001***	-.001***
		(.000)	(.000)	(.000)	(.000)	(.000)
marital status		-.007***	-.006***	-.007***	-.006***	-.006***
		(.001)	(.001)	(.001)	(.001)	(.001)
Educational attainment [Ref. education_1]	*education_0*	-.001	.000	-.001	-.001	-.001
		(.003)	(.003)	(.003)	(.003)	(.003)
	education_2	-.001	-.001	-.001	-.001	-.001
		(.001)	(.001)	(.001)	(.001)	(.001)
	education_3	-.000	-.000	-.000	.000	-.000
		(.002)	(.002)	(.002)	(.002)	(.002)
l_income		.000				
		(.001)				
employment		-.003*	-.002	-.003*	-.002	-.002
		(.001)	(.001)	(.001)	(.001)	(.001)
risk_aversion		.001	.001	.001	.001	.001
		(.001)	(.001)	(.001)	(.001)	(.001)
gender		.003*	.002*	.003*	.003*	.003*
		(.001)	(.001)	(.001)	(.001)	(.001)
hhd_size		.002***	.002***	.002***	.002***	.002***
		(.001)	(.001)	(.001)	(.001)	(.001)
sociability		-.002	-.002	-.002	-.002	-.002
		(.001)	(.001)	(.001)	(.001)	(.001)
Countries [Ref. Austria]	Germany	.002	.002	.002	.002	.002
		(.004)	(.003)	(.004)	(.004)	(.004)
	Sweden	.004	.004	.005	.004	.004
		(.004)	(.004)	(.004)	(.004)	(.004)
	Spain	.001	.001	.001	.001	.001
		(.004)	(.004)	(.003)	(.003)	(.003)
	Italy	.003	.002	.003	.003	.003
		(.004)	(.003)	(.004)	(.004)	(.004)
	France	-.001	-.002	-.001	-.001	-.001

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		M6	M7	M8	M9	M10
		(.003)	(.003)	(.003)	(.003)	(.003)
	Denmark	.005	.004	.005	.005	.005
		(.004)	(.004)	(.004)	(.004)	(.004)
	Greece	.037***	.033***	.037***	.037***	.036***
		(.009)	(.009)	(.009)	(.009)	(.009)
	Switzerland	.003	.003	.003	.003	.003
		(.004)	(.004)	(.004)	(.004)	(.004)
	Belgium	.001	.001	.001	.001	.001
		(.003)	(.003)	(.003)	(.003)	(.003)
	Israel	.007	.007	.006	.006	.006
		(.007)	(.007)	(.007)	(.007)	(.007)
	Czech Republic	-.000	-.000	-.000	.000	.000
		(.003)	(.003)	(.003)	(.003)	(.003)
	Poland	-.002	-.001	-.002	-.002	-.002
		(.005)	(.005)	(.005)	(.005)	(.005)
	Luxembourg	-.009***	-.009***	-.009***	-.009***	-.009***
		(.002)	(.002)	(.002)	(.002)	(.002)
	Portugal	.008	.007	.008	.008	.008
		(.006)	(.006)	(.006)	(.006)	(.006)
	Slovenia	-.001	-.001	-.001	-.001	-.001
		(.003)	(.003)	(.003)	(.003)	(.003)
	Estonia	-.003	-.002	-.003	-.003	-.003
		(.003)	(.003)	(.003)	(.003)	(.003)
	Croatia	.000	.002	.000	.000	.000
		(.004)	(.004)	(.004)	(.004)	(.004)
relative_inc		-.004***	-.003*			
		(.001)	(.001)			
relative_inc²		.000***	.000**			
		(.000)	(.000)			
relative_inc_d				.006***		
				(.001)		
Income quartiles [Ref. inc_quartile_1]	*inc_quartile_2*				-.004**	
					(.001)	
	inc_quartile_3				-.006***	
					(.001)	
	inc_quartile_4				-.008***	
					(.001)	
Income quartiles grouped [Ref. inc_grouped_2]	*inc_grouped_1*					.005***
						(.001)
	inc_grouped_3					-.004***
						(.001)
N		39,359	38,769	39,359	39,359	39,359
Wald X² (d.f.)		483.9*** (29)	413.1*** (30)	487.1*** (28)	494.7*** (30)	480.6*** (29)
Pseudolikelihood		-21,997,5	-20,943,7	-2,200,5	-21,944,7	-2,195,6
Hosmer-Lemeshow X² (8.d.f)		8.38	11.94	8.32	14.97*	10.14
R² McFadden		.099	.089	.0989	.101	.101

Notes: the table shows the estimates on the probit models that estimate the effect of sociability and relative income on household informal debts. In particular, the marginal effects of each estimate are identified. The levels of significance are given by * for 10%, ** for 5%, and *** for 1%. Robust standard errors are enclosed in parentheses. *d.f.* stands for the degrees of freedom.

Concerning the control variables, and regardless the type of debt, empirical evidence confirms that the decision to borrow is positively related to household size and male gender, and negatively related to the respondent's age and having a formal commitment -i.e., being married, living with the spouse or having a common-law relationship-. Additionally, household income positively affects the holding of consumer debt.

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Finally, country also matters in the decision of borrowing, especially in the case of consumer debt. Thus, 12 out of the 18 country variables show a statistically significant effect in the case of the consumer debt. These results point out that, once the effects of the respondents' own characteristics are discounted, the residents of each country have a greater (lower) probability of holding consumer debt that residents of Austria -the reference country-. Unlike consumer debt, only 2 country variables became significant in the models referred to informal debt. These results suggest that country-specific characteristics may be affecting formal debt more than informal debt. To avoid this bias, in the next section, *hypotheses 1* and *2* are re-analysed by country.

4.4. Robustness analysis

In order to analyse whether sociability and relative income are still relevant in the different countries analysed, the global sample was divided into subsamples by country and the models 2, 6, 8 and 10 were re-estimated. *Table 5* shows only marginal effects for independent variables of interest by country.

The effect of sociability on consumer debt presents some divergences when the analysis is carried out for each country. Thus, while sociability has a positive influence in Spain, Poland and Estonia, it has a negative influence in Denmark and Czech Republic. However, when informal debt is the dependent variable, the positive effect of sociability is found only in the Austrian case, whereas a negative effect is found in Belgium and Czech Republic. Therefore, *hypothesis 1* is far from being confirmed in all the countries analysed, nor in the case of consumer debt. Taking together, these findings suggest that those differences in the decision of holding consumer debt are more likely to reflect differences in country-level institutional factors rather than in individuals' sociability.

More agreement exists concerning the results referred to the relative income. Overall, regardless of how this relative income is measured, there is a positive relationship between relative income and consumer debts in nine of the countries analysed (namely, Sweden, Spain, France, Poland, Luxembourg, Slovenia, Estonia, Croatia and Belgium). These results, contrary to expected, could be suggesting that credit markets in these countries operate in a similar manner; i.e., access to credit (the offer) is more limited for low-income households. The exception would be Israel and Italy, where households with higher incomes are found to be less indebted.

Relative income variables confirm *hypothesis 2* in the case informal debt in many of the analysed countries. Households whose incomes are below the country's median income tend to be more indebted; being this relationship confirmed for Austria, Germany, Sweden, Spain, Italy, Greece, Switzerland and Belgium.

When deepening the analysis on relative income, significant effects are only found regarding one of the categories of the variable that groups income quartiles (*inc_grouped_#*), that could be indicating 'non-symmetrical' behaviours in the credit markets. That is, while in Greece it appears households in the upper income category have a greater probability of borrowing, in Spain are households in the lower income category the ones with the greatest probability (compared, in both cases, with those households whose average annual income belongs to the middle category -25-75%-). However, this effect should be further explored considering data on the credit supply; an issue that goes beyond the scope of this paper.

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Table 5. Marginal effects of key independent variables; by country

	Consumer debt						*Informal debt*					
	Number of observations	*sociability*	*relative_inc*	*relative_inc_d*	*inc_grouped_1*	*inc_grouped_3*	*Number of observations*	*sociability*	*relative_inc*	*relative_inc_d*	*inc_grouped_1*	*inc_grouped_3*
Austria	2,104	.013	-.021	.020	.006	.008	992	.006*	-.011 *	.010**	.008*	-.001
Germany	2,804	-.001	.019	-.017	.015	.015	1,710	-.002	-.005	.006	.007*	-.005
Sweden	2,416	.008	.105**	-.021	.021	.035	1,840	.001	-.018***	.011***	.011*	-.004
Spain	2,896	.023**	.022**	-.009	-.020**	.017	2,527	-.004	-.004	.010***	.001	-.009***
Italy	2,952	.014	-.006	-.005	-.004	-.024**	2,376	-.001	-.016***	.013***	.016***	-.011**
France	2,457	.017	.091*	-.024	-.039*	.033	1,881	.005	.017	-.008	Omitted	Omitted
Denmark	2,428	-.044**	.017	-.054	-.032	-.054	1,820	-.002	-.006	.006	Omitted	Omitted
Greece	1,658	.034	. 011	.003	.034	.048*	1,323	-.001	-.009	.023*	.028**	-.009
Switzerland	1,874	.001	-.008	.015	.050	.102	1,093	-.002	-.006	.012***	.003	.002
Belgium	3,800	.014	.009	-.025*	-.048***	-.019	2,881	-.012***	-.003*	.002	.001	-.007*
Israel	764	.112	-.131*	.039	.033	-.077***	681	.004	.072***	.013*	-.003	0
Czech Republic	3,011	-.018*	-.006	.009	.012	-.001	2,123	-.008**	-.004	.002	.001	-.001
Poland	267	.186**	.092**	-.109**	-.022	.173***	215	0	.112*	.021	.063 *	0
Luxembourg	1,110	.034	.103**	-.032	-.009	.018	922	.005	.201	0	-.009	0
Portugal	865	.0385	-.005	-.026	.013	.026	614	.003	.005	.011	.009	0
Slovenia	2,735	.012	.068***	-.069***	-.073***	.012	2,198	.003	.005	.001	.006	-.001
Estonia	3,626	.017**	.351***	-.020*	-.015	.035***	2,927	-.001	.005	.001	.002	-.004
Croatia	1,550	.013	.022**	-.045**	-.045**	.036	1,346	-.001	.016**	.001	-.004	.002

Finally, Table 6 illustrates the main findings regarding the variables of interest -i.e., sociability and relative income variables- on both types of loan.

Table 6. Summary of main findings

	Hypothesis 1		Hypothesis 2	
	Global sample	Sample by countries	Global sample	Sample by countries
Consumer debt	(+)	(+): 3 countries (17 % of sample countries) (-): 2 countries (50% of sample countries)	(+)	(+): 9 countries (50% of sample countries) (-): 2 countries
Informal debt	( )	(+): 1 country (6% of sample countries) (-): 2 countries (50% of sample countries)	(-)	(-): 8 countries (44% of sample countries) (+): 2 countries (11% of sample countries)

Notes: (+/ - /) denotes positive/negative/not significant effect on debt.

To sum up, the sociability effect on borrowing -despite the type of debt- cannot be confirmed when the analysis is carried out by country, as the empirical evidence found is not enough. On the contrary, the effect of relative income persists even when the analysis is carried out by country, even though maintaining a different effect depending on the type of debt - consumer or informal debt- considered. In this sense, the higher the income level, the lower the probability of incurring informal debt and the higher the probability of incurring consumer debt. This apparently contradictory effect may be due to a different nature, in terms of complexity and financial risk, of both kinds of debt.

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Conclusions

As discussed at the outset, household debt is becoming increasingly important. Hence, financial literature needs to delve deeper into the investigation of what influences households' decision to get into debt and, thus, avoiding situations of over-indebtedness. The extant research has analysed debt decisions from different approaches. In this paper, we pay attention to social interactions on households' borrowing behaviour; particularly, we stay focused on the effect of individuals' sociability and relative income.

Drawing on previous literature on social interactions and financial decisions, this paper analyses the underlying mechanisms through which sociability operates to impact on households' debts, using a sample of around 68,500 individuals from 19 European countries. It should be noted that our study distinguishes two types of households´ debts; namely, consumer debt and informal debt. The results show that the effect of sociability on households' debt depends on the type of debt -i.e., consumer or informal debt- and on the underlying mechanisms related to the peer effects -i.e., the word-of-mouth communication and the observational learning-.

As previous studies have shown (e.g., Altundere, 2014), our findings confirm that individuals who are sociable -sociability measured as a direct process of informal communication-, are more likely to get into consumer debts. However, empirical evidence reveals that informal debts seem to not be influenced by sociability when it operates through the aforementioned mechanism. The decision to get into informal debts is negatively associated with individuals' relative incomes, i.e., when sociability reflects learning effect based on observation. Individuals who perceive themselves poorer than others are more likely to borrow from peers.

Furthermore, our results suggest that the effect of sociability on consumer and informal debts seem to display some discrepancies depending on the country of analysis. However, more research is needed to be able to confirm these discrepancies. Concerning relative income, the behaviour of individuals does vary depending on the type of debt. Thus, those households whose income levels are below the country's median are more likely to get into debt. Conversely, empirical evidence reveals differences regarding the effect of income level on household indebtedness depending on the type of debt; i.e., the higher the household's income, the more (less) likely the individual is to get into consumer (informal) debt.

This paper has important implications for individuals and public policy makers. In this regard, education on debt tenure should be promoted from different educational sectors. The information on debt tenure should consider the advantages and disadvantages of the different types of debts as well as the risks inherent to each type. Besides, the government should be aware that, through its economic policies, it can also lead individuals to hold a greater or a lower amount of debt and to select one type or another. This is not a minor issue, since, as we previously noted, household debt has implications for family finances, but also for the global economy, as a situation of over-indebtedness can lead countries to decreases in their output growths or increases in their unemployment rates.

This paper also presents some limitations. Firstly, although the sixth wave of the SHARE is the most complete one regarding social issues, we have previously recognized its limitations regarding the variables on financial risk preferences and income, that include a high amount of missing values. Secondly, the variables on sociability and income level have been constructed on the basis of existing questions in the questionnaire. Future studies should benefit from measuring these variables more directly. The most common control variables acknowledged by financial literature in the field of households' debts were considered; however, it may occur that the effect of sociability and income level over consumer and

informal debts might be influenced by additional control variables that should be considered in future studies.

In short, for a variety of reasons, social interaction is a growing phenomenon in the lives of individuals that conditions many of their attitudes and behaviours, among which borrowing behaviours are not an exception. Therefore, a better understanding of the influence of sociability on this type of behaviours is needed, aimed at preventing over-indebtedness situations and at improving individuals' financial well-being.

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